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Cost Benefit Analysis: A Policy Tool of Anthropocentric Utilitarianism

Nora Anne Watson

Cost-Benefit Analysis: A Policy Tool of Anthropocentric Utilitarianism

by
Nora Anne Watson

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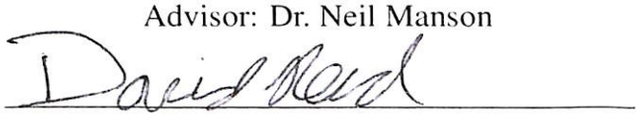
Advisor: Dr. Neil Manson



Reader: Dr. David Reed

Reader: Dr. Debra Young

ABSTRACT

NORA ANNE WATSON: Cost-Benefit Analysis

(Under the direction of Neil Manson)

For the last three decades, there has been a lively debate over the best way for a government to approach decisions of environmental policy. Adherents to anthropocentric utilitarianism - those who believe that actions are right as they tend to promote utility for humans - favor the use of cost-benefit analysis - a tool that is used to come up with recommendations for or against particular environmental policies on the basis of their probable costs and benefits. Although making decisions this way may seem like a straightforward approach that should be acceptable to everyone, many challenge the latent assumptions of the tool's application: that only humans have moral standing and that the morality of actions is a function of the utility they promote. After giving an introduction to CBA, I will articulate a variety of objections, which will include objections to the methods used in performing a CBA, objections to CBA's utilitarian framework, objections from proponents of the Precautionary Principle, and objections from advocates of the Land Ethic - a nonanthropocentric deontological position inspired by the work of Aldo Leopold. Finally, I will give an assessment of CBA in light of these objections. I expect to establish that environmental policy decisions should be informed by CBA because of the tool's emphasis on priority setting and the effective management of funds; however, I will also argue that because of problematic features of CBA as well as difficulties arising from the ethical system of anthropocentric utilitarianism, CBA does not give us all the information we need to make environmental policy decisions.

Contents

I INTRODUCTION

Over the last hundred years, the world population of tigers in the wild has declined from numbers exceeding 100,000 to an estimated 4,000. Though tigers once thrived from Turkey to Siberia, only fragmented habitats of their once expansive range remain.[1] From biology, we know that genetic drift, a mechanism of evolution, results in a loss of genetic diversity in small populations. As genetic diversity declines, the ability of the population to adapt to a changing environment suffers because natural selection has fewer options and, consequently, can proceed in fewer directions.[2] Along with other environmental factors, decreased genetic diversity places a population at a high risk of extinction in the near future. Within the last century, three of nine tiger subspecies have met this fate. Of the extant species, all are endangered, and two are listed as critically endangered by the International Union for Conservation of Nature.[3] Determined to save tigers from imminent extinction, conservationists remind us that tigers are important in many ways: they serve as top predators, they occupy a special place in the mythology of many cultures, and they are considered one of the most majestic creatures to be found worldwide.[4]

Although it may seem obvious that we must do something to protect tigers, this information alone is powerless to guide our actions. Although science succeeds in describing

[1] WWF - Local to Global Environmental Conservation,"WWF - Tigers - Population & Distribution," http://www.panda.org/what_we_do/endangered_species/endangered_species_list/tigers/tigers_population_distribution

[2] Douglas J. Futuyma, Evolution. (Sunderland, MA: Sinauer Associates, Inc., 2005), 227.

[3] The IUCN Red List of Threatened Species, "Panthera tigris," http://www.iucnredlist.org/details/15955

[4] WWF - Local to Global Environmental Conservation,"WWF - Tigers," http://www.panda.org/what_we_do/endangered_species/endangered_species_list/tigers/

the conservation status of tigers with data, those empirical facts, on their own, cannot guide us to a normative decision.[5] Neither a tabulation of tiger population numbers nor a description of their contributions to ecosystems can, by itself, lead to the conclusion that humans should invest in more aggressive conservation efforts. Answers to these types of value questions are instead discovered in philosophy.

The discipline of philosophy spans a diverse collection of questions about the fundamental nature of the universe, the essence of knowledge, and the properties of a good human life. Applied ethics is a division of philosophy that is helpful in determining the moral course of action for situations in the public arena. One branch of applied ethics, environmental ethics, considers the moral responsibility of humans to the natural world as well as the moral standing of non-human organisms.[6]

Within the field of environmental ethics, philosophers disagree about what should be placed at the center of a system of environmental valuation. Some environmental philosophers believe that nature possesses inherent worth and is deserving of moral status apart from human interests. Among these environmental philosophers, there is disagreement over whether the center of value should be the ecosystem or the individual life-bearer. Critics of these systems maintain that giving moral standing to nature is impracticable; furthermore, they strongly question the foundations of the claim that nature possesses inherent worth.

Disagreeing with the philosophers who believe in intrinsic environmental value,

[5]To do so would be to commit the naturalistic fallacy: deriving an "ought" statement, or normative statement, from an "is" statement, or empirical statement. Another way of saying this is that one cannot derive values from a set of facts.

[6]Stanford Encyclopedia of Philosophy,"Environmental Ethics," http://plato.stanford.edu/entries/ethics-environmental/

some environmental philosophers maintain that a coherent environmental ethic must be anthropocentric; in other words, the system must regard humanity as the center of value and the sole beneficiary of moral consideration. Anthropocentrism is the idea that humans are the most important beings in the natural world. The resulting principal claim is that value in nature should be human-centered. According to anthropocentrism, nonhuman life as well as nonliving ecosystem elements should be valued strictly instrumentally. Typically, anthropocentrists argue that the only practical way to encourage humans to protect the natural world is to show that doing so benefits humanity. Therefore, under an anthropocentric ethic, mankind has no direct responsibilities to the environment. Critics of anthropocentrism claim that this perspective is supremacist and inevitably harmful to the natural world.[7]

In addition to differences over the proper center of value, environmental philosophers disagree about what determines the rightness or wrongness of actions. Some environmental philosophers subscribe to utilitarianism, a moral theory most notably formulated by Jeremy Bentham and John Stuart Mill. Utilitarianism is a form of consequentialism - the view that actions are right as they tend to promote favorable outcomes and wrong as they tend to promote unfavorable outcomes.[8] It is characterized by two central principles: the principle of utility and the consequentialist principle. The principle of utility says that actions are right as they tend to promote utility and reduce disutility. Utility is typically defined in terms of happiness and pleasure and disutility in terms of pain and suffering. The consequentialist principle says that we should judge the morality of an action by the extent to which it brings about desired ends or consequences. Because of this emphasis on the ends or consequences

[7]Stanford Encyclopedia of Philosophy,"Environmental Ethics,"
http://plato.stanford.edu/entries/ethics-environmental/

[8]There are many other forms of consequentialism that are different from utilitarianism such as egoism - the view that actions are right as they tend to promote favorable consequences for oneself.

of an action, utilitarianism is sometimes characterized as a kind of teleological ethics.[9]

Deontological ethics, most notably associated with Immanuel Kant, is contrary to utilitarian ethics. Deontological ethics judges moral duty or obligation by an action's kind and the motives behind it, not the consequences of the action. Deontologists believe that the rightness of an action is independent of its consequences.[10] For example, if a statement is false, then for the deontologist, it is wrong to assert it because that would be lying. The deontologist would make this judgment even if lying would lead to better overall consequences than telling the truth. Following Kant, deontologists also think it is imperative that we never treat things that are intrinsically valuable as merely means to an end. Though Kant believed that only humans possess intrinsic worth, deontological environmental philosophers believe that nature, too, has inherent worth, and so mankind has an obligation to respect that worth even if the consequences of doing so are inconvenient.[11]

Anthropocentric utilitarianism[12] holds that actions are right as they tend to promote utility for humans. For an example of a patently anthropocentric utilitarian position, we turn to Bjorn Lomborg, author of *The Skeptical Environmentalist*, who sets forth a defense of making environmental decisions with the goal of utility maximization for humans:

"People debate and participate in decision-making processes, whereas pen-

[9]Stanford Encyclopedia of Philosophy,"Consequentialism," http://plato.stanford.edu/entries/consequentialism/#ClaUti

[10]Stanford Encyclopedia of Philosophy, "Deontological Ethics," http://plato.stanford.edu/entries/ethics-deontological/

[11]Louis P. Pojman and Paul Pojman, Environmental Ethics: Readings in Theory and Application(Belmont, California: Thomson Wadsworth, 2008), 62.

[12]It is important to point out that there are utilitarian environmental ethics that are nonanthropocentric. For example, Peter Singer, a philosopher and leader of the Animal Rights movement, gives a defense of an Animal Liberation ethic by arguing that animals deserve moral status because of their sentience - their ability to experience pleasure and pain. According to Singer, environmental policies that ignore the preferences of animals for pleasure and avoidance pain are guilty of speciesism - a feeling of superiority to animals that is equivalent to racism (Pojman, 2008, 73).

guins and pine trees do not. So the extent to which penguins and pine trees are considered depends in the final instance on some (in democracies more than half of all) individuals being prepared to act on their behalf. When we are to evaluate a project, therefore, it depends on the assessment by people. And while some of these people will definitely choose to value animals and plants very highly, these plants and animals cannot to any extent be given particular rights."[13]

Lomborg emphasizes that humans must be the point of reference for environmental policy decisions because only humans can take part in environmental decision-making. Nonhuman life, according to Lomborg, should be protected because humanity cannot exist without nature. It is often in our interest to favor environmental regulations because the survival of our species depends upon the survival of other species and ecosystems. However, even if certain species are endangered, important to our survival, or simply popular with humans, we should not, according to Lomborg, confer on them inalienable rights to protection.

As a tool of anthropocentric utilitarianism, cost-benefit analysis recommends an activity if the activity's costs to humans are outweighed by the activity's benefits to humans and does not recommend an activity if the reverse is true. To begin our discussion of this policy tool, I will give a description of how CBA is performed and illustrate its application with hypothetical examples. I will then provide a short history for the use of CBA by the United States government, provide modern day examples to show how the tool has shaped environmental policy, and give arguments in favor of CBA. After explaining CBA, I will set

[13]Bjorn Lomborg, The Skeptical Environmentalist (New York: Cambridge University Press), 12

forth several objections to CBA including objections to features of the tool itself, objections to its utilitarian framework, objections from proponents of the Precautionary Principle, and objections from advocates of the Land Ethic - a nonanthropocentric deontological position influenced heavily by the work of Aldo Leopold. Finally, after considering these objections, I will show that although CBA should inform environmental policy, it does not give us all the information we need to make environmental policy decisions.

II A BRIEF INTRODUCTION TO COST-BENEFIT ANALYSIS

II.1 How Does CBA Work?

Under CBA, an environmental regulation passes inspection if its benefits to humans exceed its costs to humans; in other words, CBA establishes whether the benefits of the regulation are "worth pursuing in light of its costs."[14] Additionally, when there are several possible courses of action, many formulations of CBA require selecting the option that maximizes the difference between benefits and costs. The step-by-step process of CBA first calls for a listing of all potential costs and all potential benefits. Two inputs determine the number of accounting units assigned to each cost and benefit: the value or utility of the cost or benefit and the probability that the cost will be incurred or the benefit gained. These inputs are multiplied to obtain costs and benefits that are weighted by their likelihood of occurrence. The probability input may be as high as 100 %, but it is often true that the likelihood of incurring a cost or gaining a benefit is less than 100%. The values of costs and benefits are largely determined by market values - what people actually pay; however, when market values do not exist for particular costs and benefits, market values are approximated by determining people's hypothetical willingness to pay.[15] To set all costs and benefits on a "common temporal footing," a discount rate is also applied so that costs and benefits in

[14]Joseph Desjardins, *Environmental Ethics: An Introduction to Environmental Philosophy* (Belmont, California: Thomson Wadsworth, 2006), 60.

[15]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): page

the present have greater value than they have in the future.[16,17]

Depending on the cost or benefit that is being taken into account, the analyst may be quite certain of both the value and the probability, uncertain about one or the other, or uncertain about both inputs. A few examples may illustrate these various situations. When calculating the cost of building supplies for a construction project, the market value of the materials is known, and it is known that there is a 100% likelihood that this cost will be incurred if the project is begun. However, sometimes probabilities that particular benefits will be gained are difficult to determine; for example, if a potential benefit of reducing deforestation of tropical rain forest in Brazil were finding a cure for HIV, analysts would be able to estimate a market value for a cure for HIV but unable to reliably determine the probability of this occurring in a particular area. In addition to uncertain probability, the value of a benefit may also be difficult to determine. If a certain environmental regulation aims to curb slash-and-burn agriculture in Madagascar and a potential benefit is the improved fitness in a population of golden bamboo lemurs[18], the probability that the regulation will improve the fitness of the lemur population is uncertain, and the value of the benefit is also difficult to determine because it is likely based on people's hypothetical willingness to pay - a measure that is only an approximation of a market value.

After the values of potential costs and benefits are multiplied by their probabilities, all costs are aggregated, and all benefits are aggregated. If the benefits exceed the costs,

[16]Robert Frank, "Why is Cost Benefit Analysis So Controversial?" *The Journal of Legal Studies* 29 (2000): 915

[17]For example, suppose we project that some course of action will give a million dollars of benefit now but produce two million dollars of cost in the future. The discounting of that cost will depend on how far in the future that cost lies. If the discount rate is high enough, or the cost is far enough into the future, CBA might yield the result that the benefit outweighs the cost.

[18]Golden bamboo lemurs are a critically endangered species endemic to and found only in Madagascar.

the regulation or activity in question passes CBA's inspection. To summarize the process, Frank writes,"The cost-benefit principle says we should install a guardrail on a dangerous stretch of mountain road if the dollar cost of doing so is less than the implicit dollar value of the injuries, deaths, and property damage thus prevented."[19] Once a CBA gives its verdict, some people believe that the results of the CBA should be treated as one consideration among others. However, some argue that the results of a CBA are always determinative of right action because following a course of action when benefits exceed costs leads to a maximization of net utility for humans - the goal of anthropocentric utilitarianism. For this reason, these people argue that the correct course of action is always the one that maximizes the difference between benefits and costs.

We can gain insight into treating CBA as a rule of decision from decision theory - the body of knowledge concerned with analyzing decision-making when outcomes are uncertain. Under decision theory, there are two main elements that inform our decisions: our beliefs about what will likely occur in the future and our values. The former is expressed in terms of probabilities and the latter is measured in terms of utilities. According to decision theory, our values are determined by the outcomes we desire, and outcomes that are more desirable than others have higher utilities. To evaluate several possible courses of action, the utility of an outcome from an action can be multiplied by the probability that the outcome will occur to find the expected value of the action. In deciding upon a course of action, one option is to apply the expected value rule, which says that one should act

[19]Robert Frank, "Why is Cost Benefit Analysis So Controversial?" *The Journal of Legal Studies* 29 (2000): 913

so as to maximize expected value.[20, 21] Those who believe it is irrational to do anything but always apply the expected value rule are called expected value rule dogmatists. To an expected value rule dogmatist, CBA is always a clear rule of decision.[22]

A hypothetical example may further explain how CBA is used to evaluate a proposed environmental regulation. Suppose that to eliminate the illegal poaching of tigers in the wild, conservationists attempt to persuade the government of Thailand to fund a campaign to put an end to the trafficking of tiger parts. A cost-benefit analyst is hired to calculate the costs and benefits of the campaign. She considers all the expenses such as those related to producing educational films, publishing literature, and traveling, and she determines that the total cost of the campaign is 100 million dollars. Then, by calculating the amount of money people are willing to pay for a substantial reduction in the illegal poaching of tigers, she figures that the calculated benefit of the proposal is 30 million dollars. Because the costs outweigh the benefits, the correct decision, according to a expected value rule dogmatist, is for the government of Thailand to refuse to fund the campaign.

II.2 History of CBA and Modern Day Examples

To better understand the relevance of CBA to environmental policy decisions, we turn now to consider the ways in which CBA has applied to environmental problems over the years and its current standing as a tool of environmental valuation. As early as the 1930s, the U.S. Corps of Engineers was required to determine if improvements to waterways sys-

[20] Ian Hacking, *An Introduction to Probability and Inductive Logic* (New York: Cambridge University Press, 2001), 99.

[21] There is a debate in decision theory over whether this is the best approach to decision-making.

[22] The incommensurability objection dealt with later will shed some light on the debate between expected value rule dogmatists and those who believe CBA should be one consideration among many.

tems were worthwhile through a consideration of costs and benefits.[23] For much of the twentieth century, environmentalists favored CBA as a method of valuation because the tool could account for externalities - consequences of industrial activities that are not counted as direct costs to the industry or to the consumer.[24] To realize the goal of taking all external environmental costs into account, the National Policy Act of 1969 mandated a CBA for any federal project having an environmental impact.[25] However, CBA became more controversial as governments began to apply it not only to environmental problems but also to environmental regulations. In 1981, President Reagan signed Executive Order 12291, which stated, "Regulatory action shall not be undertaken unless the potential benefits to society from the regulation outweigh the potential costs to society."[26] Under this executive order, all agencies were required to justify regulation by performing a CBA to prove to the Office of Management and Budget that the benefits to society of the regulation outweighed the costs to society. Though some believed that this measure would prevent needless spending on environmental protections, others feared that CBA would be manipulated to endorse deregulation. Most agreed that costs were relevant to policy decisions, but many objected to using CBA as the central element of environmental policy decision-making. These concerns have motivated environmentalists to be skeptical of the use of CBA in environmental policy decisions.

[23]Thayer Watkins, "An Introduction to Cost Benefit Analysis," San Jose State University Department of Economics, http://www.sjsu.edu/faculty/watkins/cba.htm.

[24]An example of this is a transaction between an electrical power company that uses coal-fired plants and a consumer that generates a cost (air pollution) that is born neither by the company nor by the consumer; in this example, air pollution is an externality.

[25]David Schmidtz, "On the Value and Limits of Cost-Benefit Analysis," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), page.

[26]U.S. Environmental Protection Agency," 2.2 Statutory and Administrative Requirements for Economic Analysis of Regulations," http://www.epa.gov/ttnecas1/econdata/Rmanual2/2.2.html.

A recent Supreme Court case, *Entergy Corporation v. EPA*[27], epitomizes the ongoing debate over whether CBA should be used to make decisions about environmental regulations. Power plants pull in billions of gallons of water each day from nearby rivers and lakes for cooling, and, as a result, fish and other aquatic organisms are killed or damaged by being trapped against screens or sucked into the cooling structures.[28] Under statute 33 U.S.C. §1326(b) of the Clean Water Act, Congress provided for the protection of aquatic life by requiring that the cooling water intake structures "reflect the best technology available for minimizing adverse environmental impact."[29] Applying CBA to carry out the provisions of the statute, the EPA found that the aquatic organisms concerned[30] were worth 83 million dollars, and they compared this figure to the cost of closed-cycle cooling - a technology that would nearly eliminate harm to aquatic life - which cost 3.5 billion dollars. Because, according to the CBA performed, the cost of the closed-cycle cooling system outweighed the benefit of saving the aquatic life, the EPA determined that closed-cycle cooling systems should not be required. Objecting to this interpretation of the statute, environmental groups claimed that Congress had given the EPA no authority to compare costs and benefits in determining the "best technology available" to protect aquatic life. The argument on the side of the power plants held that determining what is *best* requires a comparison of costs and benefits and that the word *minimize* does not mean maximally reduce. Challenging

[27]This case represents three consolidated cases: PSEG Fossil LLC v. Riverkeeper Incorporated, Utility Water Act Group v. Riverkeeper Incorporated, and Entergy Corporation v. Riverkeeper Incorporated

[28]Adam Liptak,"Ruling by Justices Backs Power Plants," *The New York TImes*, April. 2, 2009, Washington section, New York edition.

[29]The Oyez Project, *Entergy Corporation v. EPA* , 556 U.S. (2009), http://oyez.org/cases/2000-2009/2008/2008_07_588.

[30]The vast majority of this aquatic life was noncommercial. Because these organisms are not traded, there is no true market value for them. The 83 million dollar figure was likely a product of a calculation of people's hypothetical WTP.

this view, the environmental groups argued that the EPA never has any authority to weigh costs against benefits; they insisted that the language of the Clean Water Act clearly requires the best technology available, not the best bargain. Expressing a common objection to the application of CBA to environmental policy decision-making, Justice Souter made the following observation:

> "It seems to me that when you're talking about the possible harm from pulling in a few fish or a few plankton or a few baby clam larvae and so on, as against the cost conceivably of millions of dollars for extending intake pipes or putting technical expensive filtering mechanisms, you are dealing with such incommensurables that I don't know how on a site specific basis you would sensibly apply a cost-benefit analysis. Are a thousand plankton worth a million dollars? I don't know." [31]

On April 1, 2009, the Supreme Court reached a 6-3 decision with the ruling that the EPA may use a comparison of costs and benefits to determine what cooling structures should be used by power plants.[32]

On the other hand, government agencies have used CBA over the years to justify many environmental regulations such as greater regulation of lead in gasoline, more exacting regulation of lead in drinking water, and stricter requirements of gasoline composition to curb air pollutants.[33] In the late 1990s, the EPA used cost-benefit analysis to establish a new

[31] The Oyez Project, Oral Argument. *Entergy Corporation v. EPA* , 556 U.S. (2009), http://oyez.org/cases/2000-2009/2008/2008_07_588.

[32] Adam Liptak,"Ruling by Justices Backs Power Plants," *The New York Times*, April. 2, 2009, Washington section, New York edition.

[33] Cass Sunstein, "The Arithmetic of Arsenic," *University of Chicago Law School John M. Olin Program in Law & Economics Working Papers* 2 (2001): 12

regulatory ceiling for arsenic in drinking water. Up until the Clinton Administration, the standard had been 50 parts per billion (ppb). Research demonstrating the deleterious health effects of water with a 50 ppb concentration of arsenic - such as increased risks of bladder and lung cancers - prompted the Clinton Administration to propose a new regulatory ceiling.[34] Using CBA, the EPA evaluated several possible standards for arsenic in drinking water: 3 ppb[35], 5 ppb, 10 ppb, and 20 ppb. To calculate benefits, the EPA estimated a range for lives saved at each of these drinking water standards; the EPA also took into consideration non-quantified benefits, resulting from the unknown extent to which particular deleterious health effects result from arsenic levels below 50 ppb.[36] Benefits were then converted to dollar amounts by multiplying lives saved by 6.1 million dollars - the value of a statistical life.[37] After an analysis of costs and benefits, the EPA selected 10 ppb as the new regulatory ceiling for arsenic in drinking water.

II.3 Arguments for CBA

One of the major strengths of CBA is that it helps policymakers set priorities. When using CBA, policymakers are able to allocate resources more efficiently as well as determine whether regulations will be worthwhile. Cass Sunstein writes that by evaluating a regula-

[34]Cass Sunstein, "The Arithmetic of Arsenic." *University of Chicago Law School John M. Olin Program in Law & Economics Working Papers* 2 (2001): 16

[35]The EPA identified this as the lowest feasible MCLG, or maximum contaminant level goal.

[36]This determination may have been influenced by the precautionary principle - a policy tool that will be discussed later in this paper.

[37]The value of a statistical life, or vsl, is not the same as the value of a life. The difference is that the vsl is only meaningful in a risk context; it does not mean that people can or do buy or sell other people for 6 million dollars. The vsl is calculated by observing what people are willing to be paid to take on life-threatening health risks - in other words, market values. Cass Sunstein explains this in the following way: Imagine that a person must be paid 600 dollars a year extra in salary to take on a 1 in 10,000 risk. Because the cost to the company of a person taking on that risk is the statistical value of the person's life multiplied by the probability, we can easily solve for the vsl to get 6 million dollars.

tion by its costs and benefits, it should be possible "to spur the most obviously desirable regulations, to deter the most obviously undesirable ones, [and] to encourage a broader view of consequences."[38] CBA allows several human preferences to be considered and weighed against each other at once. Advocating a CBA approach to pollution, William Baxter writes, "Our objective is not pure air or water but rather some optimal state of pollution."[39] In saying this, Baxter does not argue for polluted air and water, but he does suggest that air and water at the most sensible levels of cleanliness will still contain some pollutants. Instead of allocating as much money as it takes to purify air and water to the best of our abilities, Baxter thinks we should balance humanity's preference for clean air and water against other human interests so that utility for humans can be maximized. Money is always limited, so policymakers must be able to make smart decisions about how to best use money for environmental regulations as well as other concerns. Pointing out the common sense rational behind CBA, Frank writes, "Scarcity is a simple fact of the human condition. To have more of one good thing, we must settle for less of another."[40]

A second argument for CBA is that it is grounded in scientific empiricism - a view that says scientific knowledge can only be gained through experience[41]. The application of CBA relies upon evidence of probable costs and benefits and does not rest on feelings, intuitions, or revelations. For this reason, CBA advocates claim that CBA provides objective reasons for funding regulation or withholding funds. By disinterestedly looking at costs

[38]Cass Sunstein, "The Arithmetic of Arsenic." *University of Chicago Law School John M. Olin Program in Law & Economics Working Papers* 2 (2001): 11

[39]William Baxter, "People or Penguins: The Case for Optimal Pollution," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 521.

[40]Robert Frank, "Why is Cost Benefit Analysis So Controversial?" *The Journal of Legal Studies* 29 (2000): 914

[41]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): 267

and benefits, the CBA analyst can provide an objective basis for policymakers to decide to which good things society should give more financial backing and to which other good things society should give less financial backing. For example, if it would take billions of dollars to make drinking water cleaner, evidence that the benefits of the more expensive purification process outweigh the costs would help policymakers justify allocating money to this project.

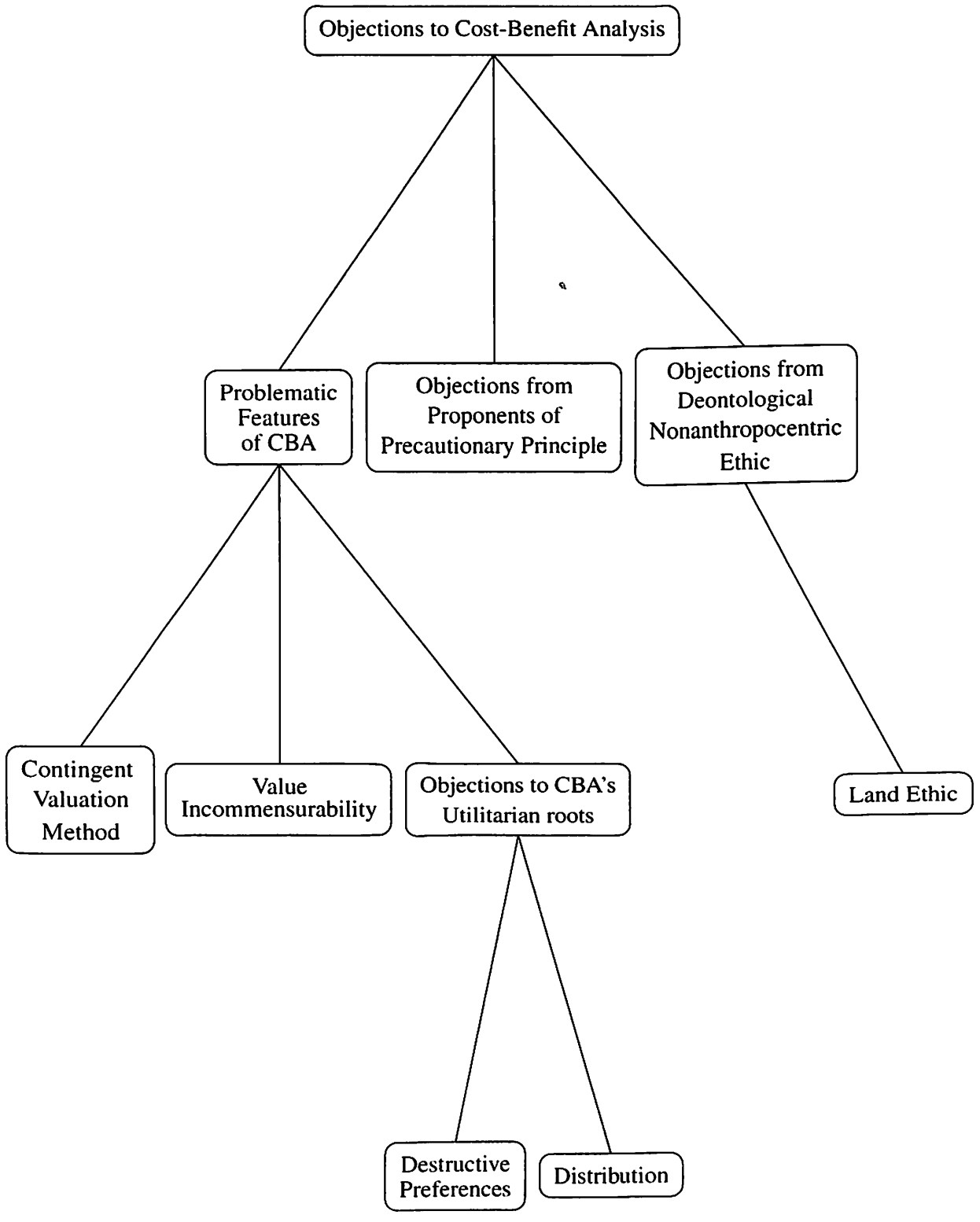
Advocates also point out that CBA conforms to the liberal ideal of personal autonomy.[42] Classical liberal theory says that a society best guarantees individual liberty when its economic system is based on free markets. Because market prices, wherever they exist, inform the calculation of WTP, a policy decision based on CBA is often based on what people actually do pay to gain a benefit or avoid a cost. In effect, CBA allows people to vote in favor of or against a tax. According to CBA advocates, it is wrong for a government to force people to pay more than their WTP because doing so violates their autonomy. Believing that CBA allows society to respect individual choices, Sunstein writes, "If regulators reject people's actual judgments then they are insulting their dignity." [43]

[42]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): 265

[43]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 371

III OBJECTIONS

Although several arguments in favor of CBA exist, CBA is a very controversial policy tool. Critics of CBA raise several objections to the methods used in calculating benefits, or people's willingness to pay; these include objections to the contingent valuation method and objections to reducing environmental values to monetary values. Other objections take issue with CBA's utilitarian grounding and point out the policy tool's lack of a distribution scheme to promote equality. Because benefits in a CBA are based on willingness to pay, critics of CBA draw attention to people's destructive preferences. Believing that CBA does not offer adequate protection to the environment, many who disapprove of CBA argue in favor of Precautionary Principle as an alternative; the Precautionary Principle says that regulations should be put in place if a potential threat is menacing enough even when cause-and-effect relationships between an industry's activity and damage to the environment are not established. Other objections come from proponents of the Land Ethic - a nonanthropocentric deontological position that is also known as ecocentrism. The Land Ethic, in contrast to anthropocentric utilitarianism, places the center of value on environmental wholes such as species and ecosystems. After presenting these objections and answers that would likely follow from an anthropocentric utilitarian, I will give an analysis that explains why CBA is an extremely useful tool to environmental decision-making but does not provide us with all the information we need to make environmental policy decisions.



A flow-chart of objections to CBA.

III.1 Problematic Feature of CBA: The Research Behind the Numbers

When performing a CBA, the analyst researches the amount of money people actually pay to gain a benefit of some probability or avoid a cost of some probability and uses this information to determine people's willingness to pay. Willingness to pay is supposed to represent all the benefits of an activity after all the benefits have been translated into dollar amounts and aggregated. However, sometimes it is impossible to determine what people pay for a good in real-world markets because people do not pay for it at all; market values do not exist for much of the natural world such as endangered species or biodiverse hotspots.[44] When market values do not exist for goods of the natural world, economists largely rely upon the contingent valuation method, which involves surveying people to find out what they would be willing to pay in a hypothetical situation.[45] The following example comes from a survey that was sent to 800 households in the states of Arizona, Colorado, New Mexico, and Utah to estimate the WTP for protection of nine species of endangered noncommercial fish. The survey asks people to state their WTP for improvements to the rivers of the Four Corners Region, which is the critical habitat of the fish.

> Suppose a proposal to establish a Four Corners Region Threatened and Endangered Fish Trust Fund was on the ballot in the next nationwide election. How would you vote on this proposal? Remember, by law, the funds could only be used to improve habitat for fish. If the Four Corners Region Threatened and Endangered Fish would cost your household $_____ every year, would you

[44]Dennis King, "Ecosystem Valuation: Contingent Valuation Method Overview," Ecosystem Valuation, http://www.ecosystemvaluation.org/contingent_valuation.htm.

[45]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 358

vote in favor of it? Circle Yes/ No (King).[46]

For the blank, there were fourteen possible dollar values ranging from $1 to $350, and they were randomly distributed among the households.

Upon gathering the returned surveys, the average WTP was found to be $195. Once this value was extrapolated to the entire population of people living in the Four Corners Region, it was clear that the benefits, represented by the total WTP, greatly exceeded the costs of the proposed regulation. Therefore, the results of the CBA recommended that the Four Corners Region Threatened and Endangered Fish Trust Fund be established for the preservation of the endangered fish.

Many of the objections leveled against the contingent valuation method focus on the artificiality of surveys. Critics of the method insist that people's answers to hypothetical questions often do not match their behaviors in actual situations.[47] People, in general, are notoriously bad at estimating. If survey respondents who buy annual gym memberships are prone to overestimating the amount of time they will spend at the gym by over 70%,[48], they are likely worse at estimating their willingness to pay for the environment. Answers to hypothetical questions are heavily influenced by the perceived likelihood of the situation actually happening. If people perceive that the likelihood of actually having to pay is low, they may greatly exaggerate their WTP; conversely, if people perceive that they will likely have to pay for regulation, they may understate their WTP.

[46]Dennis King, "Ecosystem Valuation: Contingent Valuation Method: Case # 1– Economic Value of Non-commercial Fish," Ecosystem Valuation, http://www.ecosystemvaluation.org/contingent_valuation.htm.

[47]Dennis King, "Ecosystem Valuation: Contingent Valuation Method: Issues and Limitations of the Contingent Valuation Method," Ecosystem Valuation, http://www.ecosystemvaluation.org/contingent_valuation.htm.

[48]Stephen J. Dubner and Steven D. Levitt, "The Gift-Card Economy," *The New York Times* http://www.nytimes.com/2007/01/07/magazine/07wwln_freak.t.html?partner=rssnyt&emc=rss

Problems also arise when people fail to answer the specific questions posed by the survey. People may strongly value an environmental good but state that they are willing to pay little to nothing because they disagree with specific aspects of the regulation proposed.[49] For example, they may approve of the goal of conserving California condors but disapprove of higher taxes as a means to the goal. It is also possible that people may decide upon a dollar amount based on their approval or disapproval of the survey itself. The contingent valuation method often suffers from non-response bias because those who do not respond likely have different perspectives from those who do respond, and those perspectives are not represented in the results of the survey. For all these reasons, critics of the contingent valuation method worry that answers to hypothetical questions should not be relied upon in a determination of economic value.

In addition to these concerns, critics point out that people are not accustomed to thinking about environmental values in monetary terms. Because people do not purchase or sell beautiful sunsets, pristine beaches, and magnificent redwood forests, it is very difficult for them to place a price tag on these environmental goods. These difficulties are compounded by the public's lack of familiarity with ecological science. Therefore, economists who rely upon contingent valuation surveys run the risk of basing environmental valuation on uninformed or misinformed preferences.

CBA advocates admit that surveys have their limitations; however, they contend that contingent valuation surveys are our best option for valuing environmental goods that lack market prices. Research can reduce biases within surveys. Although people have difficulty

[49]Dennis King, "Ecosystem Valuation: Contingent Valuation Method: Issues and Limitations of the Contingent Valuation Method," Ecosystem Valuation, http://www.ecosystemvaluation.org/contingent_valuation.htm.

thinking about the environment in monetary terms, trade-offs are inevitable in a world of limited resources. Governments must be able to set priorities, and these priorities should be informed by what the public considers to be important environmental concerns.

Another criticism of the contingent valuation method is that it fails to engage people in a debate about what regulations should be funded. Simply answering questions on a survey by selecting a dollar amount or circling *yes* or *no* does not facilitate the exchange of well-reasoned arguments. Desjardins writes that it is important for people "to explain why [they] value clean air and water and justify why [they] value the preservation of wilderness areas."[50] Because humanity depends upon the environment, environmental policy decisions should be determined through a political process involving deliberation among people who are willing to pay different amounts. Spash writes that those who apply CBA can make the mistake of "construing deliberation as a process of discovery, searching out wants, rather than a process of reflecting upon what there is most reason to want." [51]

Those who criticize basing a total benefits calculation on the results of contingent valuation surveys assert that this approach treats people as mere consumers and ignores their roles as citizens. Consumers want things for themselves and spend their money in such a way as to satisfy their wants. Consumers desire things like Life cereal for breakfast and Downey soft toilet paper, and the money they spend on these products is an appropriate measure of the benefits they derive from them. On the other hand, citizens have a broader interest in society; for example, they desire low levels of pollution for their community, not just for themselves.

[50]Joseph Desjardins, *Environmental Ethics: An Introduction to Environmental Philosophy* (Belmont, California: Thomson Wadsworth, 2006), 67.

[51]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): 273

Critics contend that there are fundamental differences between an individual's desire for a hamburger to satisfy his hunger and an environmental goal for clean air that he shares with other members of his community. Explaining the difference between these roles, Spash writes, "We act as consumers to get what we want for ourselves. We act as citizens to achieve what we think is right or best for the community."[52] For this reason, citizens should decide what they are willing to pay through a democratic process that allows reasons for regulation to be articulated and defended. Sagoff writes that in contrast to preferences, which cannot be inherently right or wrong, beliefs can be false or unjustified.[53] The belief that society should be willing to pay x dollars to meet an environmental goal should, therefore, be argued in a public forum instead of being assessed through the results of contingent valuation surveys.

Disputing the claim that preferences are strictly appetitive, CBA advocates point out that consumers reflect on why they should want something before they form their preferences.[54] A consumer's beliefs inform his preferences, and the truth or falsity of those beliefs is important to him. For example, an individual may desire a hamburger because he believes eating a hamburger will mitigate his iron deficiency. If it turns out that eating a hamburger will not address his iron deficiency in the slightest, the falsity of his belief is relevant to his preference. If he discovers that his belief is false, he likely will be inclined to change his preference. The consumer is able to explain his preference with reasons; this suggests that consumers often decide upon their preferences through a deliberative process.

[52]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): page

[53]Joseph Desjardins, *Environmental Ethics: An Introduction to Environmental Philosophy* (Belmont, California: Thomson Wadsworth, 2006), page.

[54]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): page

CBA advocates also challenge the binary concept that someone acts as either a consumer or a citizen. A person filling out a contingent valuation survey can be trusted to respond as both a consumer and a citizen even if the survey itself does not facilitate a community-wide discussion. If even a small number of people in a community believe that a regulation should be funded, they may persuade their neighbors that they should be willing to pay for it. Also, the news media offers people a wide variety of opportunities to enter into a public discussion that takes in arguments for and against a proposed environmental regulation. It is likely that these public discussions influence the way people respond to contingent valuation surveys. Pointing out that CBA gives us a way of organizing information that is important to a public discussion, Schmidtz writes, "CBA done in public view helps to give democracies a fighting chance to operate as democracies are supposed to operate."[55]

III.2 Problematic Feature of CBA: Incommensurable Values

CBA requires that decisions be made by a comparison of costs and benefits. In order for all costs and all benefits to be taken into account, they must be translatable into a common measuring unit. CBA advocates claim that all values can be expressed monetarily; however, critics of CBA disagree. Some values, they claim, are incommensurable with each other. Two values are incommensurable when they cannot be placed on a "common footing" by

[55]David Schmidtz, "On the Value and Limits of Cost-Benefit Analysis," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 639

using a single metric such as money.[56] Furthermore, when values are incommensurable, there is no general way to correctly rank a value as better than or equal to another value. Explaining incommensurability, David Wiggins writes that for two values A and B, A and B are incommensurable "if there is no general way in which A and B trade off in the whole range of situations of choice and comparison in which they figure."[57] For example, a value for love is not in general better than or equal to a value for liberty. The belief in value incommensurability leads some to the conclusion that CBA ignores or misrepresents any non-economic values in the process of environmental valuation. CBA assumes the idea of value monism - the view that there is only one value to which all other values are reducible. Opposing this view, critics of CBA often identify with value pluralism the idea that there are many distinct values, which are not reducible to each other. Converting all values to a single measure like money may make a decision about environmental regulation easily calculable, but critics believe that it presents a facile solution that fails to represent what people actually do when they make moral decisions.

According to value pluralists, CBA masks the reality that independent values conflict and compete. In fact, an attempt to reduce one value to another is sometimes in direct opposition to people's moral instincts. For example, asking someone to convert his or her value for honesty to a monetary value sounds like the beginnings of a bribe.[58] A new decision process, according to critics of CBA, should recognize a plurality of "deeply felt values and commitments, which require a suitable context and process for their articulation

[56]Robert Frank, "Why is Cost Benefit Analysis So Controversial?" *The Journal of Legal Studies* 29 (2000): page

[57]Nienhe Hsieh, "Incommensurable Values," Stanford Encyclopedia of Philosophy, http://plato.stanford.edu/entries/valueincommensurable/.

[58]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): 274

and defense."[59] Critics of CBA hold that attentiveness to economic value should be an important part of environmental valuation, but they maintain that it should be thought of as one value among others. Value pluralists call for a "multiple criteria decision process"[60] that, unlike CBA, does not attempt to reduce cost and benefit considerations to one kind of value.

The controversy behind India's recent launch of "the people's car," more notoriously known as the "world's cheapest car," illustrates the problem of incommensurable values.[61] With its first commercial debut in March of 2009, the Tata Nano, priced at 100,000 rupees ($2500), offers India's rising middle class the option of more convenient travel at an affordable price. Currently, most commuters travel by bicycle or motorbike, and only 7 in 1,000 people in India currently own cars. However, Tata Motors expects to sell 1,000,000 Nanos a year, which will increase India's car market by 60%. The chairman of Tata motors, Mr. Ratan Tata also has plans to market this car to Europeans and Americans who may be looking for a cheaper car in the wake of the recent economic downturn.[62]

Although the Nano promises to help the poor, environmentalists are concerned that the availability of a cheap car will lead to mass motorization, which will increase fuel demands and contribute significantly to air pollution and greenhouse gases.[63] In a country with a population exceeding one billion - most of whom have until now relied upon bicycles and scooters for travel - the availability of a cheap car is expected to increase the number of

[59]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): 275
[60]Clive Spash, "How much is that ecosystem in the window?" *Environmental Values*, 17 (2008): 265
[61]Ashling O'Connor, "Tata Nano - world's cheapest new car is unveiled in India," TimesOnline, http://www.timesonline.co.uk/tol/driving/article3164205.ece.
[62]Nick Kurczewski, "How Tata Built the Nano for Less," *The New York TImes*, April, 1, 2009, http://wheels.blogs.nytimes.com/2009/04/01/howtatabuiltthenanoforless/?ref=automobiles.
[63]Ashling O'Connor, "Tata Nano - world's cheapest new car is unveiled in India," *The Times*, January 11, 2008, http://www.timesonline.co.uk/tol/driving/article3164205.ece.

drivers by tens of millions. According to the Center for Science and Environment in Delhi, more than half of India's cities already have critical levels of air pollution. Environmentalists argue that because car maintenance is an unlikely priority in the third world, the Nano will become a huge source of pollution as catalytic converters break down and are not replaced. This is an example of a negative externality an instance where there are consequences of an economic transaction between two parties that spill over to a third party. The buying and selling of Tata Nanos does not only affect Tata Motors and the Nano purchasers; the transaction has an impact on the wider community and the cities of India because each vehicle contributes to air pollution. Furthermore, the transaction has an impact on the world because each new vehicle adds to greenhouse gases in the atmosphere.[64]

Elucidating the problem of value incommensurability, the Nano presents a moral dilemma to those who care for human welfare and the environment. Because the Nano offers bicycle-riders safer and more convenient transportation and improves access to employment opportunities, the Nano finds support in the value for equality. However, environmental values oppose the Nano because of the car's expected contribution to air pollution and greenhouse gases. In this situation, value pluralists would argue that the values for equality and the environment cannot be converted to common currency for use in a CBA. Instead, they say that the values for equality and the environment compete with each other; for this reason, they claim that a solution must be found by a valuation method that can accommodate a plurality of values.

In answer to the incommensurability objection, CBA advocates point out that people

[64]Mark Magnier, "India's Tata Motors unveils the world's cheapest car," *Los Angeles Times*, March 24, 2009, http://www.latimes.com/news/nationworld/world/la-fg-india-car24-2009mar24,0,3689671.story.

can and do make decisions involving trade-offs even when multiple values are involved. Robert Frank gives the following example to demonstrate that even seemingly incommensurable values are commensurable with each other.

> Few people would oppose a new technology that would reduce the cost of power by half if its only negative effect were to degrade our view of the Grand Canyon for just one 15-second interval each decade. By the same token, no one would favor adoption of a technology that produced only a negligible reduction in the cost of power at the expense of a dark cloud that continuously shielded North America from the rays of the sun.[65]

In Frank's example, there are two values: economic value and aesthetic environmental value. Because it is more useful to us to save billions of dollars on power than it is to save fifteen seconds of Grand Canyon viewing, we make the trade-off to save money on power. The common footing for these values is their utility. Similarly, saving a little money on power is less useful to us than saving clear skies. Because we are able to put different values on a common footing in these examples, it is true in at least some cases that we can measure different values by the same standard. In a world where scarcity is a fact of life, we must make these comparisons in order to set priorities for our limited resources.

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[65]Robert Frank, "Why is Cost Benefit Analysis So Controversial?" *The Journal of Legal Studies* 29 (2000): 914

III.3 Destructive Preferences

To perform a CBA on a proposed environmental regulation, the analyst must calculate the total potential benefits of the regulation by determining what people are willing to pay to gain particular benefits. The WTP calculation may be based on market values - what people actually pay or are paid for a good or on the results of contingent valuation surveys, which attempt to approximate peoples individual WTPs. In either case, critics point out that if a WTP is only a reflection of preferences people are willing to financially support, then the correct policy decision must be the one that has the most financial backing; on these grounds, critics claim that CBA cannot consistently guide us to moral policy decisions. Desjardins writes that if financially supported preferences are determinative of policy decisions, "Those who are willing to pay the most, for all intents and purposes, have the right view; theirs is the more informed opinion, the better aesthetic judgment, and the deeper moral insight." [66]

According to critics of CBA, the policy tool gives preferences weight based on how strongly they are felt - expressed in the amount of money someone is willing to pay - instead of giving preferences weight based on what the preferences are. Disagreeing with this view of preferences, Desjardins writes, "A more realistic and honest assumption would seem to be that whether what I want is a good thing depends on what it is that I want." [67] Even if someone is willing to pay millions so that a preference may be satisfied, the money he is willing to pay is only an expression of how strongly he desires something and not a

[66] Mark Sagoff, "At the Shrine of our Lady of Fatima," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 624-625.

[67] Joseph Desjardins, *Environmental Ethics: An Introduction to Environmental Philosophy* (Belmont, California: Thomson Wadsworth, 2006), 66

justification for that desire. Expressing his disapproval of the WTP criterion, Mark Sagoff writes, "Economics can measure the intensity with which we hold our beliefs; it cannot evaluate those beliefs on their merits."[68]

Critics argue that relying on preferences is problematic because sometimes people want things that do not promote their welfare and do not want things that do promote their welfare.[69] In fact, the satisfaction of many preferences is destructive to the preference-holder. For example, many people have preferences for cocaine and are willing and able to pay for a fix. Sometimes people form preferences with incomplete or inaccurate information. For example, because people do not understand the holistic nature of ecosystems, they may be willing to pay more for conservation projects for the giant panda than they would be willing to pay for efforts aimed at conserving genetic diversity. Even though genetic diversity is far more important to the goals of conservation than a single endangered species, people are more familiar with pandas because they have seen pandas on television and at the zoo; on the other hand, most people do not know what genetic diversity is, let alone why it is important. Mark Sagoff points out that just as correct answers in mathematics are independent of peoples preferences, questions of environmental regulation should not be decided by how much people are willing to pay. Sagoff writes, "No matter how much people are willing to pay, three will never be the square root of six."[70] Critics argue that for similar reasons, people's willingness to pay for environmental benefits about which they know little is an inappropriate basis for environmental policy decisions.

[68]Joseph Desjardins, *Environmental Ethics: An Introduction to Environmental Philosophy* (Belmont, California: Thomson Wadsworth, 2006), 63.

[69]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 28

[70]Mark Sagoff, "At the Shrine of our Lady of Fatima," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 626.

In answer to these objections, advocates of CBA assert that CBA is based on classical utilitarianism, not preference utilitarianism. Preference utilitarianism says that a morally right action is one that results in the most preference satisfaction; in contrast, classical utilitarianism holds that a morally right action is the one that optimizes utility.[71] It is consistent with classical utilitarianism to ignore the desires of someone who is mentally incompetent or ignorant because the goal is to maximize utility, not to satisfy as many preferences as possible. Cass Sunstein[72] writes, "If peoples WTP reflects impulsiveness, recklessness, an absence of information, or insufficient deliberation, then it is for other people, in government as elsewhere, to draw their attention to that fact." [73] Sunstein goes on to say that a low WTP may in a small number of cases be overridden on the grounds that it is rooted in errors factual or otherwise.[74]

Though CBA draws support from the political ideal of autonomy, CBA may also respect nonautonomous decisions when the decision-maker is misinformed or incapable of thinking rationally. The liberal ideal of autonomy allows for, at least in some formulations, soft paternalism - the overturning of autonomous decisions that result from mental incompetence or ignorance.[75] It is, after all, easy to imagine how basing policy decisions on the preferences of people who are misinformed could promote disutility. Explaining this view of autonomy, Sunstein writes,

"The idea of autonomy requires not merely respect for whatever preferences

[71] Walter Sinnott-Armstrong,"Consequentialism."Stanford Encyclopedia of Philosophy, http://plato.stanford.edu/entries/consequentialism/

[72] CBA believer who President Obama picked to head the Office of Information and Regulatory Affairs

[73] Sunstein,

[74] Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 28.

[75] Gerald Dworkin, "Paternalism," Stanford Encyclopedia of Philosophy, http://plato.stanford.edu/entries/paternalism/

people happen to have, but also social conditions that allow preferences to be developed in a way that does not reflect coercion or injustice. With respect to some risks, the relevant preferences are nonautonomous."[76]

Because the determination of WTP is flexible in this way, people's destructive preferences should not present an insurmountable barrier to effective valuation.

III.4 Distribution

Because cost-benefit analysis is a policy tool of anthropocentric utilitarianism, general objections to utilitarianism are relevant to a discussion of CBA. Although the goal of utilitarianism is to maximize net utility, the ethical system does not favor one scheme of distribution of utility over any other. In other words, a utility distribution scheme that made 2% of the population exceedingly happy at the expense of 98% of the population is just as good as a distribution scheme that equally deals out happiness to 100% of the population. Critics of utilitarianism contend that the system should not be relied upon exclusively because it does not provide for the realization of equality.

The distribution problem is further exacerbated by the calculation of benefits, which are determined by figuring out how much people are willing to pay to gain something good or avoid something bad. People's willingness to pay is affected by their resources. Rich people are willing to pay far more for benefits than poor people simply because they have more money at their disposal. Poor people cannot be willing to pay more than what

[76]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 28).

they have; they may value an environmental good just as much as a rich person does but have a lower WTP. For this reason, the rich are in a better position to have their utility maximized. Critics of CBA say that CBA disproportionately favors the rich and that unless the rich are willing to pay to protect the interests of the poor, CBA will favor the status quo and perpetuate social inequality.[77] Utilitarian Henry Sidgwick attempted to address this problem by proposing that equality should be used to "break ties."[78] In other words, if two distribution schemes maximized the same amount of net utility, then the one that promoted equality more should be selected. It is important to note that utilitarians must go outside of utilitarianism to find a solution to the distribution problem.

A distribution problem specifically concerning CBA deals with the uncertainty over who should bear the costs and who should receive the benefits. It could be consistent with an outcome of CBA to adopt a policy decision that subjected the poor to terrible living conditions that resulted in higher healthcare expenses to create wealth for the rich. Some claim that indeed this happens. Critics claim that the application of CBA results in environmental racism - racial discrimination in the enforcement of environmental regulations and the placement of polluting industries.[79] They argue that as a result of CBA, the poor bear disproportionate environmental risks. Robert Bullard cites a number of studies showing that poor or minority communities receive less protection from environmental risks than affluent or white communities.

[77]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 9

[78]Walter Sinnott-Armstrong,"Consequentialism,"Stanford Encyclopedia of Philosophy, http://plato.stanford.edu/entries/consequentialism/

[79]Robert Bullard, "Overcoming Racism in Environmental Decision Making," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 644.

According to Bullard, the distribution of poor people and minorities is correlated with higher air pollution and more frequent instances of lead poisoning. Bullard writes, "The current environmental protection paradigm has institutionalized unequal enforcement [and] traded human health for profit."[80] Explaining what he calls procedural inequity, Bullard notes that environmental regulations are not enforced equally in poor communities and affluent communities. In poor communities, the penalties for violating hazardous waste laws are much lower than they are in affluent communities. The clean-up for hazardous waste sites is often delayed in poor or minority communities. When a hazardous waste site is located near poor or minority neighborhoods, the area is more often walled off than it is cleaned up through permanent treatment. Describing geographic inequity, Bullard points out that communities located near environmental hazards like landfills, refineries, and toxic waste dumps are more often poor or minority communities.[81] Bullard writes that environmental justice requires the prevention of harm before it occurs and a shift of the burden of proof to the polluting industries. Instead of requiring the individual to establish a cause-and-effect relationship between the activities of an industry and an environmental harm, it should be the industry's responsibility to prove that their actions do not cause environmental harm.[82] Bullard writes, "Relying solely on proof of a cause-and-effect relationship as defined disguises the exploitive way the polluting industries have operated in some communities and condones a passive acceptance of the status quo." [83]

[80] Robert Bullard, "Overcoming Racism in Environmental Decision Making," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 644.

[81] Robert Bullard, "Overcoming Racism in Environmental Decision Making," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 652.

[82] We will revisit this idea in the following section on the Precautionary Principle.

[83] Robert Bullard, "Overcoming Racism in Environmental Decision Making," in *Environmental Ethics: Read-*

CBA does not only raise questions over the distribution of costs and benefits. Critics of CBA assert that in some cases if a certain proposed policy stands to greatly help the poor, then the policy should be adopted even if the costs of doing so exceed the benefits. Even if the poor are not willing to pay enough to justify regulation by CBAs standards, some environmental risks are so high that they violate human rights.[84] In these cases, a low WTP should be ignored, and other people, the government, should step in to reduce to the risk. For example, lead poisoning in children remains a serious problem in the United States. Lead exposure to children under the age of six is very harmful because it is easily absorbed, and it interferes with children's development. There are several effects of high blood lead levels that are irreversibly damaging to ones health: lead poisoning lowers IQ, harms hearing, contributes to learning disabilities and hyperactivity, and stunts growth. According to a 2005 report by the Center for Disease Control and Prevention, poor children and children of minority groups are poisoned at higher rates than children of white or affluent families.[85] About 310,000 children - 1.6% of children aged 1- 5 - have blood lead levels (BLLs) that are dangerously high. Among African American children, 3.1% of children aged 1- 5 have blood lead levels that are dangerously high, so African American children are subject to a risk that is twice as great as that of the larger population of children. Due to lead poisoning prevention programs, the mean BLLs in children has dropped substantially in the past two decades. Lead poisoning in children is largely due to

ings in Theory and Application, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 654

[84]Cass Sunstein, "Cost Benefit Analysis and the Environment,"*University of Chicago Law School John M. Olin Program in Law & Economics Working Papers*2 (2001): 26

[85]"National Center for Environmental Health — Childhood Lead Poisoning Prevention Program — Gen Info Page — CDC," Centers for Disease Control and Prevention, http://www.cdc.gov/nceh/lead/faq/about.htm

lead-based paint in older homes. Prevention programs aim to identify these environmental hazards to make homes safe for children. Households in poor or minority communities may have low WTPs that cause a CBA to recommend against a prevention program. However, reducing racial and class disparities of environmental risk is important to promoting equality. Even if the costs to society exceed the benefits, critics of CBA maintain that the prevention program should be adopted because doing so promotes environmental justice.

In answer to the claim that poor neighborhoods are targeted by polluting industries, David Schmidtz demonstrates that a random lottery to pick out a waste treatment facility site could easily result in the non-random result of poor people living in the facility's neighborhood.[86] He rhetorically asks whether selecting neighborhoods by random lottery would be a more respectful process. He explains that if Beverley Hills were selected by random lottery as the neighborhood for the waste treatment facility, the residents would either offer some large sum of money to any neighborhood that would offer to take the waste treatment facility or they would simply sell their homes. The people who would either accept a large amount of money to take a waste treatment facility or buy homes in a neighborhood with a waste treatment facility will most likely be poor. This is simply because middle class and upper class people prefer homes in neighborhoods without eyesores and can afford to live in these neighborhoods. Schmidtz writes, "One thing will never change: waste treatment facilities will tend to be found in poorer neighborhoods."[87]

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[86] David Schmidtz, "On the Value and Limits of Cost-Benefit Analysis," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 637

[87] David Schmidtz, "On the Value and Limits of Cost-Benefit Analysis," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 638

III.5 The Precautionary Principle

A major objection to cost-benefit analysis is that we can never be sure that we have taken all costs and benefits into account. Analysts using cost-benefit analysis for environmental decision-making presume to account for all costs and benefits and accurately weigh them according to their likelihood of occurrence; however, many critics of CBA point out that we can never fully know the costs and benefits of many activities and that we are often uncertain of the probabilities of incurring particular costs and reaping particular benefits. Believing that we need a tool that will appropriately guide us when we are uncertain about the full environmental impact of an action, many critics of CBA believe that the Precautionary Principle is a better tool for environmental decision-making. The Precautionary Principle has many different formulations but the general idea is that if there is an environmental threat of a serious enough nature that is believed to be a possible consequence of an activity, then that activity should be regulated, temporarily prohibited, or banned. A famous statement of faith in the Precautionary Principle comes to us from the 1992 Rio Declaration of the U.N. Conference on Environment and Development:

> "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[88]

[88]Neil Manson,"Formulating the Precautionary Principle," *Environmental Ethics* 24 (2002): 264.

The Precautionary Principle, in contrast to CBA, does not require that we use science to establish whether a serious environmental threat is a probable consequence of an activity. Even if science does not demonstrate a causal relationship between an activity and an environmental effect, the Precautionary Principle simply calls for regulation of the activity if the believed potential effect, which many only be a guess, is threatening enough. In contrast to the Precautionary Principle, CBA guides decisions by what is known to make sensible trade-offs instead of giving the benefit of the doubt to unknown effects. If causality is not established between an activity and an effect, the cost of the effect does not factor into the accounting of costs and benefits. However, according to the Wingspread Statement on the Precautionary Principle, causality does not have to be proven, for it says:

> "Where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically." [89]

Furthermore, even if causality is established, the probability of an effects occurrence no matter how small is irrelevant to the application of the Precautionary Principle. So, theoretically, if there is a one in one quadrillion chance that an activity will lead to the extinction of nearly all the world's fish, then we should, as a precaution, ban the activity. Proponents of the Precautionary Principle call for its application when a believed potential effect is "harmful to humans, catastrophic, irreversible, such as to result in the loss of something irreplaceable, such as to reduce or eliminate biodiversity, or such as to violate the rights of members of future generations." [90] Instead of requiring government agencies to produce

[89]Wingspread Statement on the Precautionary Principle, Janunary 1998, http://www.gdrc.org/ugov/precaution3.html

[90]Neil Manson,"Formulating the Precautionary Principle," *Environmental Ethics* 24 (2002): 266.

evidence of harm, the burden of proof is shifted to the industry that would be performing a particular activity to show evidence of safety. This sometimes entails proving that there is zero risk of any significant environmental damage following from a particular activity.

To better understand how the precautionary principle impacts policy decisions, we can consider, as examples, how it has been employed in several European countries to block and place restrictions on products of agricultural biotechnology. Greatly suspicious of genetically modified foods and crops, Austria has used the precautionary principle to block the cultivation of MON810 maize - the only genetically modified crop that is approved for cultivation in the EU. Austria has deemed it appropriate to ban the cultivation of this insect-resistant crop because of the possibility that pest insects will become resistant, which may require the use of stronger chemical pesticides. Austria has also banned herbicide-tolerant plants even though it is established that this would benefit agriculture because there is concern that a possible increase in herbicide use may result. Even though there is no scientific evidence to show that using herbicide-tolerant plants will bring about greater herbicide use, the precautionary principle calls for heightened regulation simply because people perceive an environmental threat. This perception is largely due to irrational public fears, superstitions, and misunderstandings about gm crops; in this way, the precautionary principle is used as a political tool to appease the public. The basis of the decision to heavily regulate does not have to be scientifically sound because it is up to the industry to prove that there is no way an increase in herbicide use will follow from the incorporation of herbicide-resistant plants.[91]

[91] Helge Torgerson and Franz Seifert, "Safety Regulation of Transgenic Crops (SRTC)," Austria: Precautionary Blockage of Agricultural Biotechnology, http://technology.open.ac.uk/cts/srtc/.

Though advocates of the precautionary principle believe that regulating in the absence of knowledge offers better environmental protection than CBA, it quickly becomes clear that the precautionary principle could be used to rule out any course of action. In effect, the precautionary principle only serves to reflect public fears and biases against one course of action; government agencies applying the precautionary principle fail to realize that all courses of action, which includes taking no action, have risks associated with them. In this way, the precautionary principle is "paralyzing"[92] because the tool cannot recommend anything. Asserting this point, Sunstein writes that the precautionary principle "stands as an obstacle to regulation and nonregulation, and to everything in between."[93]

Offering examples to show how consistent application of the precautionary principle is disabling to government agencies, Sunstein refers to the reduction in the regulatory ceiling of arsenic levels that occurred in the first years of the Bush administration.[94] In the worst-case scenario, a 50 ppb arsenic regulatory ceiling would have resulted in 100 lives lost per year, but a 10 ppb regulatory ceiling - costing over 200 million dollars per year - could save as few as six lives annually. Not only is it unclear that the benefits will be worthwhile in light of the cost of the regulation; the precautionary principle, if applied to all course of action being considered, cannot recommend regulation. Because stronger regulation will cause a great increase in the cost of water for households in rural communities, there is concern that people in those communities will resort to using well water, which is

[92]Sunstein, Cass. "Beyond the Precautionary Principle." *University of Chicago Law School John M. Olin Program in Law & Economics Working Papers* 2 (2003): 21

[93]Sunstein, Cass. "Beyond the Precautionary Principle." *University of Chicago Law School John M. Olin Program in Law & Economics Working Papers* 2 (2003): 21

[94]This was discussed earlier as an example of CBA because a CBA was formally performed to evaluate possible courses of action; however, the ultimate decision upon a 10 ppb regulatory ceiling was influenced by the precautionary principle because the analysis took into account the cost of the unknown effects of arsenic at levels below 50 ppb.

often very polluted. It is not the case that there are possible deaths associated only with one option; all options have serious potential risks.

Applying the precautionary principle not only ignores the potential risks of regulation, it also ignores the potential benefits of nonregulation - otherwise known as opportunity benefits. In many situations, there is a possibility that fewer deaths will result under less stringent regulation; however, the precautionary principle only considers potential problems that might result from nonregulation. Sunstein offers the example of drugs being tested before being released to the public.[95] If the process of FDA approval is very strict, more people will likely die because they lack access to life-saving drugs that are still being tested. Similarly, strong restrictions against the cultivation of genetically modified crops has the potential to result in more deaths because the potential benefit of alleviating world hunger with the cultivation of gm crops will be lost. If the goal is to use precaution, neither stricter nor more lenient regulations can be recommended. However, those who apply the precautionary principle do not confront this reality because they place the burden of proof on industry to establish with certainty that environmental harm will not result from a particular activity. There is no burden of proof placed on any group to show that opportunity benefits with the potential to save many lives will not be lost.

Though advocates of the precautionary principle criticize CBA for weighing costs and benefits in the face of uncertainty, it is clear that those who apply the precautionary principle are in more trouble. Every option has its own risks. If those who apply the precautionary principle choose to believe that only the potential harms of nonregulation are

[95]Sunstein, Cass. "Beyond the Precautionary Principle." *University of Chicago Law School John M. Olin Program in Law & Economics Working Papers* 2 (2003): 21

relevant to policy decisions, they are selectively sensitive to potential harms, for it is clear from the examples we considered that more harm can result from more stringent regulation. Instead of relying on unfounded public biases against particular courses of action, the results of CBA are grounded in knowledge, and the goal is to make the best policy decision with the information known. For these reasons, CBA is feasible as a policy tool. On the other hand, the Precautionary Principle is not feasible as a policy tool because, if consistently applied, it would not be able to recommend any course of action. In this way, the Precautionary Principle is less protective of the environment than CBA.

III.6 The Land Ethic

As we have established earlier, CBA is a policy tool of anthropocentric utilitarianism - an ethical system that calls for the maximization of utility for humans in making decisions of environmental policy. Many people oppose this approach to environmental decision making. Proponents of nonanthropocentric deontological environmental ethics believe that nature has intrinsic value and, therefore, has a right to be protected. In contrast to anthropocentric utilitarianism, which holds that nonhuman life can only hold instrumental value, nonanthropocentric deontological environmental ethics maintain that nonhuman life should be treated as ends in themselves. According to this position, CBA is inadequate as a tool for environmental protection because following CBA violates the rights of nonhuman life. One prominent nonanthropocentric deontological environmental ethic is the land ethic, which is also known as ecocentrism. The land ethic calls for a change in the way people think about their relationship to the environment. In order to protect the environment, humans,

according to this view, must realize that they are one species among many; they must relinquish the role of conqueror and assume the role of member. This call requires humans to consider human concerns as no more important than concerns to any other species.

The land ethic was first developed by environmental thinker Aldo Leopold who worked for the U.S. Forest Service before becoming a professor of Wildlife Management at the University of Wisconsin. In his influential book *A Sand County Almanac*, Leopold lays the groundwork for the land ethic. Leopold begins with the claim that ethics arose as an evolutionary adaptation that began by affecting relations between individuals and later shaped relations between the individual and society. Leopold asserts that ethics has not evolved to adequately govern humanity's relationship to the biotic community - an ethic that broadens humanity's moral concern to include the land and all nonhuman life. Describing ethics as a "kind of community instinct in the making," [96] Leopold asserts that humanity needs an ethic that will enlarge the boundaries of the community to include the land. Because we presently lack this community instinct, Leopold sets forth a defense of the land ethic. The complexity, stability, and orderliness of nature, to Leopold, suggests that it is intrinsically good and should be protected. Leopold believes that if ecological science is studied by everyone, people will grow to love, admire, and respect the environment, and they will understand the importance of preserving it. A love for nature, according to Leopold, will lead people to put an end to man-made environmental destruction.[97] In this way, the science of ecology, to Leopold, serves as a bridge between descriptive facts and normative judgments about the environment.

[96] Aldo Leopold, "Ecocentrism: The Land Ethic," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 164.

[97] Aldo Leopold, "Ecocentrism: The Land Ethic," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 164.

Leopold is critical of tools of economic analysis such as CBA because, he claims, most of wildlife has no economic value and, therefore, stands little chance of being protected.[98] As people learn ecology, Leopold believes they will have a deep appreciation for value in the environment, but this value, according to Leopold is not value in an economic sense but value in a "philosophical sense."[99]

Providing a land ethic principle to guide environmental decision-making, Leopold writes, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."[100] This view is known as environmental holism - the idea that the center of value for an environmental ethic should be environmental wholes such as species and ecosystems. This ethic differs from other nonanthropocentric deontological ethics, which hold that the center of value should be the individual life. According to the land ethic, individuals should be sacrificed if that is what it takes to preserve the whole species or the whole ecosystem. For example, the land ethic mandates that the population of deer in an area should be kept under control so that the deer do not eat all of the vegetation and starve themselves or other animals. Land ethic proponent, J. Baird Callicott explains this judgment as he writes, "It would be wrong for the federal fish and wildlife agency, in the interest of individual animal welfare, to permit populations of deer, rabbits, feral burros, or whatever to increase unchecked."[101]

The idea of environmental holism fits in neatly with Leopold's conception of the

[98]This objection is covered in the subsection on value incommensurability.

[99]Aldo Leopold, "Ecocentrism: The Land Ethic," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 171.

[100]Aldo Leopold, "Ecocentrism: The Land Ethic," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 172.

[101]J. Baird Callicott, "The Conceptual Foundations of the Land Ethic," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 178.

importance of man's understanding that he is part of a community. Leopold makes it clear that humans must see themselves as members of a larger biotic community in order to prevent environmental degradation; Leopold writes, "A land ethic changes the role of *Homo sapiens* from conqueror of the land community to plain member and citizen of it. It implies respect for his fellow members, and also respect for the community as such."[102] This view is radically different from an anthropocentric ethic, which places humanity at the center of environmental concern.

Advocates of anthropocentric utilitarianism and CBA point out several flaws in the reasoning of the land ethic. Leopold believes that he can derive normative claims from the facts of ecological science; however, this is wrongheaded. Deriving environmental values from environmental statements of fact epitomizes the naturalistic fallacy. The land ethic says that we should admire, respect, and protect environmental wholes but gives no reasons for doing this other than the fact of a species' or ecosystem's existence. There is no foundation to Leopold's claim that an action's rightness is determined by whether it preserves the integrity and stability of the biotic community. The science of ecology is useful for describing how nature is interconnected. It is, furthermore, beneficial to CBA because it establishes that certain states of the environment are costly to humans. However, this does not mean that the science of ecology can provide us with an environmental ethic. Demonstrating this problematic feature of the land ethic, Desjardins gives an example of a field whose biota composition changes from grasses to shrubs to pine forests to oak forests and asks what it means for this field to keep its integrity and stability.[103] The confusion

[102] Aldo Leopold, "Ecocentrism: The Land Ethic," in *Environmental Ethics: Readings in Theory and Application*, ed. Louis Pojman and Paul Pojman (Belmont, California: Thomson Wadsworth), 164.

[103] Joseph Desjardins, *Environmental Ethics: An Introduction to Environmental Philosophy* (Belmont, California: Thomson Wadsworth, 2006), 187.

created by this reasoning weakens the land ethic's prescriptive ability; for this reason, CBA presents a more action-guiding means of protecting the environment.

The land ethic's emphasis on environmental holism draws another important objection. If humans are only members of the biotic community and human concerns should be considered no more important than any other species' concerns, the land ethic, if consistently applied, would demand the killing of humans to protect the integrity of other species. Appalled at this implication of the land ethic, some critics have called this view environmental fascism. This problem presents a horned dilemma to proponents of the land ethic: if humans are plain members, the land ethic requires us to violate human rights to preserve the integrity and stability of nature; but if humans are more than plain members, the land ethic is self-contradictory.

IV ANALYSIS AND CONCLUSION

After a careful consideration of arguments in favor of and arguments opposing CBA, we can now evaluate the appropriateness of CBA as a policy tool for environmental decision-making. CBA clearly has several advantages: it is effective at guiding the allocation of limited resources, it is grounded in science, and it respects the autonomy of individuals by not requiring people to spend more on regulation than they are willing to pay. These features of CBA are helpful to government agencies that aim to make environmental policy decisions that are prudent, nonarbitrary, and fair.

We also surveyed a variety of objections to CBA. Some of these objections centered on problematic features of CBA such as its employment of the contingent valuation method, its comparison of incommensurable values, and its roots in utilitarianism. These objections do not take issue with CBA's anthropocentrism; in other words, those who make these objections agree with advocates of CBA that the goal of environmental protection is to protect environmental goods for humans. The use of the contingent valuation method weakens CBA's ability to guide us in actions that protect the environment because the benefits of noneconomic environmental goods are determined by asking people hypothetical questions about how much they would be willing to pay to set environmental protections in place. It is well established that people are bad at estimating, so there is little assurance that this method successfully approximates a market value for an environmental good. However, this may be the best method we have to represent costs and benefits associated with

noneconomic environmental goods. The incommensurability objection does not present a significant challenge to CBA because people do frequently make trade-offs that involve considerations of different values, and they do so in a predictable way. Assigning economic value to the benefit of reducing a risk of damage to a species or an ecosystem is simply a tool for prioritizing the protection of environmental goods. Under objections to CBA's utilitarian roots, the argument that points out that people have destructive preferences is easily defended by making a distinction between classical and preference utilitarianism. However, the distribution objection brings to our attention some serious problems with CBA. Because CBA is a tool of anthropocentric utilitarianism and all distribution schemes are equally valid under utilitarianism, the application of CBA alone to environmental problems cannot provide us with a way to promote equality, which is a concern of government agencies that are charged with making environmental decisions. Sometimes a low WTP should be disregarded if it results from the respondent's poverty. Also, if two courses of action are being considered and they both pass CBA's inspection but one of them has a greater difference between benefits and costs and the other promotes equality, anthropocentric utilitarianism cannot sufficiently guide us in which one we should choose.

Other objections to CBA that we considered proposed alternative approaches to environmental decision-making. Though advocates of the Precautionary Principle claim that CBA is misguided because costs are never fully known, it is clear that possible costs and benefits exist for every option. If the precautionary principle is committed to restricting all options that have possible, serious consequences, it is incapable of recommending any activity; to use the words of Cass Sunstein, it is paralyzing. Another alternative approach is the land ethic–a nonanthropocentric deontological environmental ethic that asserts that

all environmental wholes have a right to continued existence and calls humans to view themselves as members of a biotic community, as opposed to conquerors of nature. Because this ethic commits the naturalistic fallacy, its claim that it is right to preserve the beauty and integrity of the biotic community has no reasoned support. Furthermore, strict adherence to the land ethic would require that we violate human rights to keep the human population in check. Because of these problems, both of these alternatives are much less successful than CBA is at offering guidance in environmental protection.

From an analysis of arguments for and against CBA, it is clear that the policy tool is appropriate for informing environmental decision-making. However, anthropocentric utilitarianism cannot by itself guide us in selecting one distributional scheme over any other. Therefore, making environmental policy decisions often requires us to step outside anthropocentric utilitarianism to find a justification for a particular course of action. This suggests that though CBA is extremely helpful in that it gives us a way to set priorities and effectively manage funds, CBA does not give us all the information we need to make environmental policy decisions.

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